SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lower Kissimmee Basin

Groundwater Model Document

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EXECUTIVE SUMMARY

The Lower Kissimmee Basin Groundwater Model includes all of Okeechobee and Highlands counties and most of Glades County. It also includes portions of Polk, Osceola, Indian River, St Lucie, Martin, Palm Beach, Charlotte, DeSoto and Hardee counties. The Lower Kissimmee Basin Groundwater Model is a four-layer, steady-state MODFLOW model. The model was developed as a revision to the Glades, Okeechobee and Highlands model, which was developed for the 2000 Kissimmee Water Supply Plan. The new model revisits the hydrostratigraphy in area as a result of the recent investigations conducted in south Florida. The hydrostratigraphy data in the model region are still sparse and there are no data points in the Lower Floridan Aquifer.

The model was developed to provide support for the South Florida Water Management District's (SFWMD's) comprehensive regional water supply plan for the Kissimmee Basin. The model will be used to evaluate the effects of projected increases in groundwater withdrawals from the Upper and Middle Floridan aquifers. The model was calibrated using water use estimates from 1995. The calibration took place with the following criteria in mind: In the Surficial Aquifer System, the simulated heads were to be within 4 feet of the observed heads. For Upper and Middle Floridan aquifers the simulated heads were to be within 2.5 feet of the Average 1995 Upper Floridan Potentiometric Surface Map. The water levels in Surficial Aquifer System are not above land surface (except water bodies). The calibrated model produced simulated water levels generally in agreement with observation values.

A model is a tool used to represent an approximation of the field data and is built to assist in understanding of the ground flow system. The model is a steady-state model and therefore represents a state of equilibrium under averaged stress conditions. In reality, the stresses would vary with time. The model also averages the hydrologic properties and stresses for each cell in model grid. Despite these limitations the model should be a valuable tool to assess the behavior of the groundwater system under varying climatic conditions (1-in-10 rainfall, drought condition) or changes in water consumption (population growth or changes in agricultural crops).